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AEGLA SPECTABILIS, A NEW SPECIES OF FRESHWATER CRAB FROM THE EASTERN SLOPE OF THE NAHUELBUTA COASTAL CORDILLERA, CHILE

Carlos G. Jara

Abstract.—A new species, *Aegla spectabilis* (Crustacea: Anomura: Aeglidae), is described from the Nahuelbuta region in central southern Chile. Morphologically it is related to *A. rostrata* and *A. denticulata,* both from Chile. Its most prominent feature is the robust spinulation on the margins of the carapace and dorsum of legs. It can be distinguished from all other species of *Aegla* by its spiniform palmar crest and the strong spine on the dorsum of carpus of the chelipeds.

The Chilean aeglid fauna is currently represented by 12 species of *Aegla* Leach (1821) (see Retamal 1981 and Jara 1982). Among them, three, namely *A. denticulata* Nicolet (1849), *A. rostrata* Jara (1977), and *A. bahamondei* Jara (1982) stand out from the remaining Chilean species mostly because of the prominent spinulation on the margins of the carapace (Jara 1982). All three occur in the region between Concepción (36°50′S) and Valdivia (39°30′S) (see Jara 1977, 1980, 1982), but *A. denticulata* ranges farther to the south (Bahamonde and López 1963). The Nahuelbuta Coastal Range, in which the type-locality of *A. bahamondei* is located (Jara 1982), extends into this part of the country. The same author mentions that specimens of *Aegla,* referable with doubt to *A. bahamondei,* were collected at a locality situated to the southeast of the Nahuelbuta Range. However, no previous record of *Aegla* from the eastern slope of Nahuelbuta proper exists.

In this paper, a fourth strongly ornamented form of *Aegla,* found in a river system that drains part of the eastern slope of Nahuelbuta, is described as a new species.

Aegla spectabilis, new species
Fig. 1

Holotype.—Instituto de Zoología, Universidad Austral de Chile, IZUA C-637, adult female, Chol Chol River under bridge on outskirts of Chol Chol, 29 km northwest of Temuco (38°36′S, 72°51′W) by road, Chile, 21 Dec 1982, coll. C. G. Jara.

Paratype.—IZUA C-633, young female, Perquenco River at Galvarino town, 27 km north of Chol Chol (38°25′S, 72°47′W) by road, Chile, 22 Dec 1982, coll. C. G. Jara.

Diagnosis.—Rostrum long, styliform, acute; orbital spine well developed; first hepatic lobe spiniform; anterior and posterior branchial margins strongly denticulate; anterolateral angle of second abdominal epimeron upturned, spiniform; fourth thoracic sternum with median spiniform tubercle; palmar crest as single acute projecting spine; dorsum of carpus of chelae with long acute spine; dorsal margin of carpus of ambulatory legs denticulate; merus of ambulatory legs with distodorsal and distoventral ends spiniform.

Description of holotype.—Carapace ovoid,

dorsoventrally depressed and laterally expanded in branchial regions. Middorsal line elevated but not forming longitudinal carina; dorsum of carapace more ridge-roofed than convex, bearing sparse long fine setae arising in groups from small pits; setae denser, shorter, and stiffer on both sides of middorsal line of abdominal terga. Precervical region of carapace much narrower than postcervical.

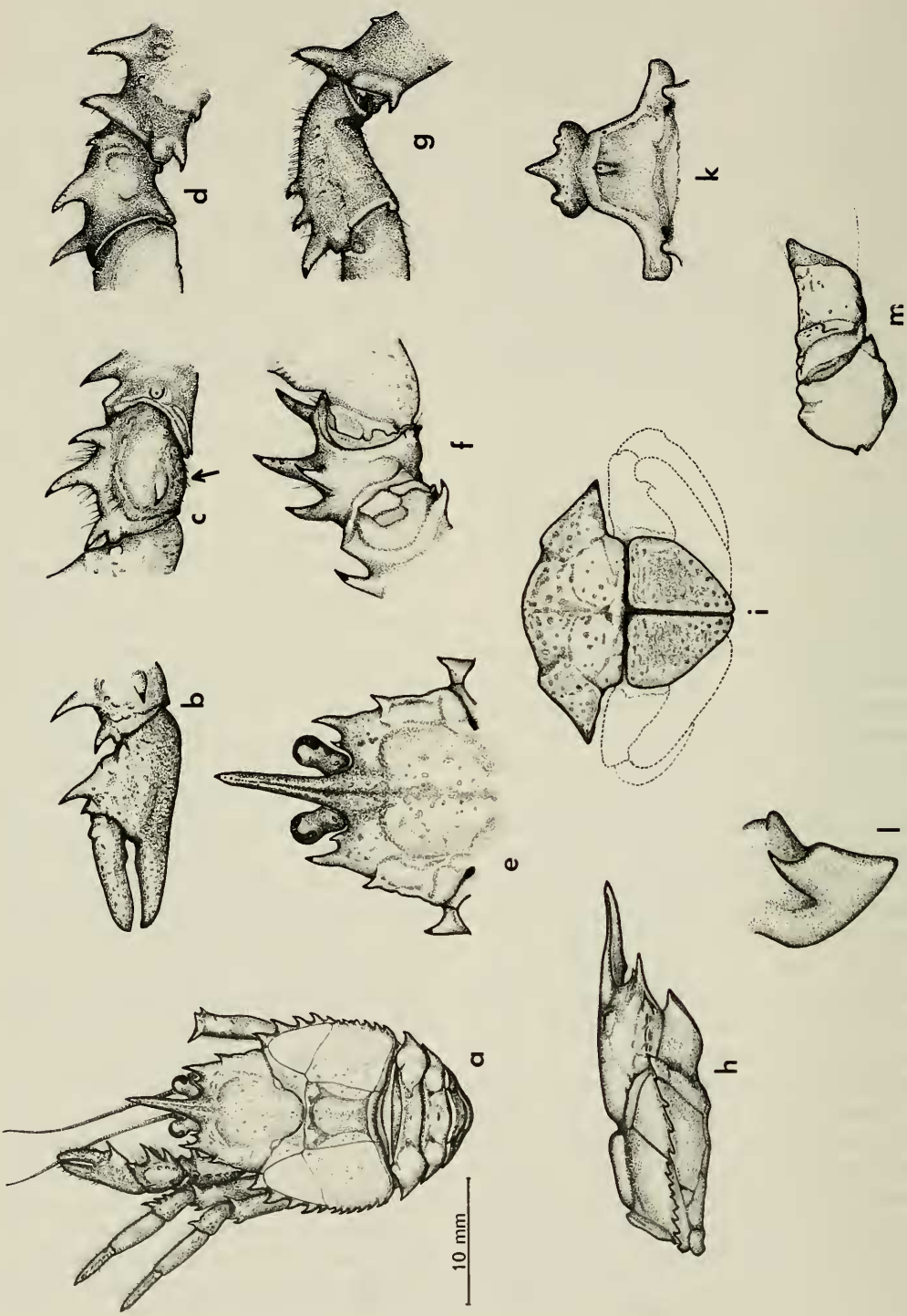
Rostrum long, slender, tipped with acute conical scale; distal third slightly upturned and dorsally flattened. Rostral carina narrow but well marked along proximal half of rostrum, bearing irregular row of small scales intermingled with setae; shallow grooves on both sides fading out beyond midlength of rostrum; height of rostral carina at level of corneae less than depth of ventral keel. Rostral tip surpassing eyestalks by 2.5 length of cornea. Rostral and orbital margins without scales.

Orbits U-shaped, wide, moderately deep; orbital spine large, conical, acute, inclined toward anterolateral angle of carapace; extraorbital sinus wide, deep, subrectangular, its maximum aperture little less than half maximum orbital aperture. Anterolateral lobe of carapace not particularly flattened and produced as large conical spine reaching midlength of cornea; main part of spine directed laterally while acuminate tip inclined toward midline. External margin of anterolateral lobe little scabrous but not scaly.

Hepatic area expanded laterally, somewhat flattened dorsally and limited inwardly by shallow groove separated from more elevated gastric area; first hepatic lobe separated from anterolateral lobe by wide subcrescentic moderately deep notch, its free angle produced as strong, laterally divergent, acute spine. Second and third hepatic lobes relatively well defined and limited by small blunt-angled notches; dorsum of third moderately inflated. Epigastric eminences consisting of slender, arcuate, little protuberant nodulose ridge behind which semicircular finely punctate depression extending to base of protogastric eminences. Latter moderately prominent, forming small blunt conical protuberance tipped with small lenticular scale separated from base of rostral carina by shallow concavity. Gastric area protuberant, its uppermost zone flat. Branchial areas expanded laterally, their free margins denticulate. Anterior branchial margin with 5 broad based, conical, somewhat dorsally depressed denticles, their frontally recurved tips with acute scale, decreasing in size posteriorly and separated by wide semicircular indentations. Posterior branchial margin with 6 (right) and 8 (left) small but clear cut, acute, conical denticles almost uniform in size, incurved frontally, and markedly upturned, especially the last. Dorsal surface of anterior branchial area slightly concave; posterior branchial area convex toward midline but concave behind free margin. Cardiac area subrectangular, slightly wider at frontal than at rear end. Areola limited laterally by subparallel grooves, subrectangular, about 1.5 times longer than broad, markedly protuberant, and regularly convex from side to side.

Abdominal terga deeply sculptured, with narrow, shallow groove devoid of setae along midline. Anterolateral angle of second abdominal epimeron noticeably upturned and produced as broad based, triangular, laterally compressed, sharp spine; tip rising above dorsal surface of epimeron reaching laterally to level of tips of posterior branchial denticles; anteroventral margin of epimeron below anterolateral angle almost straight, ending in blunt ventral angle. Lateral surface of epimeron between anterolateral and ventral angle quite concave. Angles of third and fourth epimera also sharply acute. Telson plate dimerous, subpentagonal. Fourth thoracic sternum with projecting, subconical, slightly compressed, corneous tipped, but almost blunt, ventromedial tubercle.

Cheliped (only left one present) slender. Chela subrectangular in dorsal view, dor-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soventrally depressed, its dorsal surface with short stiff setae and tiny scales. Fingers slightly curved; when closed leaving wide open gap between finely crenulate inner margins. Movable finger with small acute tubercle on its dorsal edge close to propodus. Anteromesial lobe of palm small, spiniform, separated from palmar crest by narrow deep notch. Palmar crest consisting of single, long, conical, sharply acuminate spine; its proximal base bearing 2 very small swellings tipped with setae. Carpal lobe produced in slender, acute spine. Carpal crest forming 2 long, sharp, slightly recurved, and widely separated spines; proximal spine about two-thirds as long as distal one; row of 4 small blunt tubercles tipped with setae present above carpal crest and behind carpal lobe; another dorsal crest situated external to and clearly separated from former consisting of long sharp acuminate curved spine, as long as the second in inner crest, followed by blunt tubercle. Ventral face of carpus armed with long acute spine about size of second spine of inner carpal crest. Space between ventral spine and inner crest with several long thin setae. Merus with dorsal row of 4 spiniform tubercles, distalmost longest and second shortest; distodorsal vertex also spiniform; inner ventral margin smooth with single distal long curved spine; outer ventral margin with 3 spines of which proximalmost longest and second shortest. Ventromedial margin of ischium smooth, with only broad blunt tubercle proximally. Distodorsal and distal ventrolateral angles of merus of pereiopods projected in strong conical acute spine; merus of second left pereiopod also with minute acute tubercle on distal fifth of dorsal margin; distodorsal angle of carpus of pereiopods strongly spiniform, preceded by 1 to 3 smaller but also strong spines in row decreasing in size proximally.

Table 1.—Somatometry of *A. spectabilis*, new species, type series. All measurements in mm. CL, carapace length, distance between rostral apex and posterior margin of cephalothorax; RL, rostral length, distance between rostral tip and midpoint of transverse line tangent to deepest points of orbital margins; PCL, precervical length, distance between rostral tip and midpoint of cervical groove; FW, frontal width, distance between tips of anterolateral angles of carapace; PCW, maximum precervical width, distance across third hepatic lobes; CW, maximum carapace width; LCL, left cheliped length; RCL, right cheliped length; L2PL, length of second left pereiopod; L2DL, dactylar length of second left pereiopod; L4DL, dactylar length of fourth left pereiopod; TL, telson length. F: female.

Collection		IZUA-C 637	IZUA-C 633
Specimen	:	Holotype	Paratype
Sex	:	F	F
CL	:	19.5	15.0
RL	:	6.1	4.1
PCL	:	13.9	10.6
FW	:	6.1	4.9
PCW	:	9.9	8.3
CW	:	15.5	13.0
LCL	:	20.7	16.1
RCL	:	—	15.4
L2PL	:	23.5	17.9
L2DL	:	5.7	4.1
L4DL	:	5.9	4.3
TL	:	3.2	2.9

Color (alcohol fixed specimens).—Dorsum of carapace vinaceous (Ruber 3) as background color but with several changes of intensity in different regions. Margins of rostrum, orbits, and crest of rostral carina dark blood red (Ruber 8). Epigastric areas between proto and epigastric eminences

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Fig. 1. *Aegla spectabilis* (all illustrations from holotype): a, Dorsal view; b, Left chela (dorsal); c, Carpus of left cheliped (dorsal), arrow points to large middorsal spine; d, Carpus of left cheliped showing large middorsal spine in profile; e, Dorsal view of rostral area; f, Carpus of left cheliped (ventral); g, Carpus of second left pereiopod; h, Lateral view of cephalothorax; i, Telson plate; k, Third and fourth thoracic sterna; l, Lateral view of second abdominal epimeron; m, Ventral view of ischium of left cheliped.

purplish black (Purpureus 9). Midline behind epigastric eminences and dorsum of posterior branchial areas sepia (Aurantiacus 9). Distal half of marginal spines of branchial areas apricot (Aurantiacus 2) while corneous apex of all spines translucent saffron yellow (Aurantiacus 3). Dorsum of pereiopods orange (Aurantiacus 4) or honey yellow (Flavus 5). Ventral surface of body and appendages marmoreous white or slightly yellowish with some iridescences. (Color standards according to Paclt 1958).

Variation and measurements.—The single female paratype differs from the holotype in the following respects: rostrum shorter, surpassing eyestalks by 1.5 times length of corneae; dorsum of carapace more regularly convex; front comparatively narrower; branchial margins less upturned and expanded laterally but clearly denticulate; in dorsal view, anterior margin of anterolateral angle of second abdominal epimeron closer to posterolateral angle of carapace; dorsal spiniform process of movable finger very small, lacking apical scale; ventromedial tubercle on fourth thoracic sternum blunt, without apical scale.

Measurements of the holotype and paratype specimens are presented in Table 1. Measurements were made with calipers to the nearest 0.1 mm; the morphometric characters here considered are those defined by Jara and López (1981).

Distribution.—Known only from the type-locality and from Galvarino, 27 km north of the type-locality, in the Perquenco River which is a tributary of the Chol Chol River.

Natural history.—The river section where the holotype of *A. spectabilis* was collected corresponds to an epipotamal facies; there the current velocity reached about 0.8 m sec^{-1}. The greenish turbid water flowed over a sand and gravel bottom limited on the sides by steep banks covered by bushes and bamboo-like vegetation. The water temperature on 21 December 1982 was 20°C, pH 7.9, and conductivity 53 uS cm^{-1}; dissolved oxygen reached 13.3 mg l^{-1}. The paratype was collected in a river section of hyporithral characteristics where current velocity reached an average of 0.6 m sec^{-1} flowing over boulders and stones without gravel or sand. Water was transparent, its temperature on 22 December 1982 was 17.5°C, ph 7.0, conductivity 95 uS cm^{-1}, and dissolved oxygen 13.6 mg l^{-1}. At both localities *A. spectabilis* was collected together with a second, largely more abundant, species of *Aegla* not yet identified but very similar to *A. rostrata* Jara. As samplings were done tracking counter-current for long stretches of the bottom with a sack-like kick net, the microhabitat conditions preferred by *A. spectabilis* are not known.

Etymology.—From *spectabilis* (Latin), amazing. The specific name refers to the surprisingly heavy ornamentation of this species of *Aegla.*

Comparison.—*Aegla spectabilis* resembles *A. denticulata* Nicolet, 1849, and *A. rostrata* Jara, 1977, both from Chile. With them it shares a rather short ovoid carapace greatly expanded at the branchial level, a long, tapered, acute rostrum, robust acute spines on the anterolateral angles of the carapace, well developed orbital spines, an acute and somewhat exserted first hepatic angle, conspicuously denticulate branchial margins, and strongly armed chelipeds; moreover, the dorsodistal angle of the carpus and merus of the ambulatory legs are acute or spiniform and the anterolateral angle of the second abdominal epimeron is spiniform and buttressed behind by a ridge which arises from the tergum. In *A. spectabilis,* however, the dorsum of the carapace appears to be more depressed, the denticles on the branchial are better defined and more prominent, and the chelae are less massive than in the other two species. The areola of *A. spectabilis* is more protuberant than that of *A. rostrata* but less than that of *A. denticulata* though in *A. spectabilis* the areola has a faint keel along its midline. The anterolateral angle of the second abdominal epimeron of *A. spectabilis* is more upturned

than it is in *A. rostrata* and *A. denticulata.* With *A. denticulata* it shares the prominent conical tubercle on the fourth thoracic sternum and the scarcely defined proto- and epigastric prominences, but *A. spectabilis* lacks the pronounced carina along the dorsum of the carapace which distinguishes *A. denticulata.* On the other hand, *A. spectabilis* resembles *A. rostrata* in possessing a long, narrow rostrum and wide U-shaped extraorbital sinuses but differs from it in several other respects, mainly in the form and size of the chelae and the distinctness of the branchial denticles.

Neither *A. denticulata* nor *A. rostrata* has a row of spines along the dorsal margin of the carpus of the ambulatory legs as *A. spectabilis* has. Two spines on the distodorsal vertex of the carpus of the ambulatory legs are mentioned for *A. lenitica* Buckup and Rossi, 1977, from Brazil, and a row of spiniform scabrosities along the carpal margin are drawn but not mentioned in the description of *A. parana* Schmitt, 1942, also from Brazil. However, in no other species of *Aegla* are these spines as well developed as in *A. spectabilis.*

A single-spined carpal crest of the chelipeds, such as that found in *A. spectabilis,* is approached only by that drawn and described by Schmitt (1942) for the holotype of *A. sanlorenzo* Schmitt, 1942, from Argentina; however, the character was absent in the specimens of *A. sanlorenzo* examined by Ringuelet (1949a). Finally, the long slender spine on the external half of the dorsum of the chelipedal carpus in *A. spectabilis* is a unique feature, not shared with any other aeglid. Whereas in *A. parana* Schmitt, 1942, a middorsal row of spiniform tubercles is located in a position similar to that occupied by the spine in *A. spectabilis,* no tubercle is markedly larger than the others.

Remarks.—Aegla spectabilis is the most profusely ornamented form of *Aegla* yet described. Because of the shape of its rostrum, it could be included in the Pacific rostrum type group of *Aegla* proposed by Schmitt (1942). However, because of its two most distinctive characters, namely the spiniform carpal crest and the spine on the dorsum of the chelipedal carpus, it clearly departs from the remaining species of *Aegla.* Due to these particular attributes it perhaps deserves to be allocated to a separate subgeneric or generic taxon but such a decision seems premature in view of the need for a revision of all the species assigned to the unique genus *Aegla.* The current diagnosis of the genus *Aegla* (see Leach 1821, Nicolet 1849, Girard 1855, Hobbs, Hobbs et al., 1977) seems too broad, not adequately assessing the morphological variation displayed by aeglids. At least several subgeneric categories should be recognized in order to arrange the species according to their presumed phylogenetical relationships which, up to now, have been partially scrutinized only by Ringuelet (1949b).

The degree of spinulation varies greatly among aeglids and some ideas about their possible phylogeny have been advanced regarding tendencies of morphological transformation among the species. Schmitt (1942: 442) supposed that "the least differentiated, least spiny or ornamented species stands nearest the ancestral *Aegla.*" If Schmitt's opinion is correct then the spinulation of *A. spectabilis* would be apomorphic. At variance with Schmitt's opinion, Ringuelet (1949a, b) stated that a common trend among several Argentinian species is toward reduction of orbital spines and extraorbital sinuses. According to him (1949), the species of *Aegla* "nearest the ancestor" are those which possess wide concave extraorbital sinuses, large orbital spines, a wide front, long anterolateral spines, a prominent rostrum with a sharp carina not throughed on both sides, and a spiniform second abdominal epimeron. If Ringuelet's opinion is correct then *A. spectabilis* morphology would be plesiomorphic in several respects.

The tendencies of character transformation observed among Chilean aeglids seem to indicate that an extreme reduction of or-

namentation as well as an extreme development of spinulation may be considered as apomorphic conditions. In fact, the greatest reduction of spines is shown by *A. alacalufi* Jara and López, 1981, and, to a lesser degree, by *A. papudo* Schmitt, 1942. Both species share an undivided telson plate while the remaining aeglids have dimerous ones (Jara and López 1981). The monomerous telson plate is undoubtedly apomorphic. Other Chilean aeglids which show reduced spinulation are: *A. maulensis* Bahamonde and López, 1963, *A. manni* Jara, 1980, and *A. concepcionensis* Schmitt, 1940. With the exception of *A. maulensis,* all of these species live in small brooks and streams associated with the Chilean western continental slope, and possibly, they are phylogenetically related.

On the other hand, the trend toward profuse spinulation seems to be correlated with living in lentic environments. Thus, *A. rostrata,* from Lake Riñihue, most likely represents a lacustrine lineage derived from less spiny riverine forms (see Jara 1977, 1982). The same trend is demonstrated by *A. denticulata* which is widespread in small, moderately fast running streams in the provinces of Valdivia, Osorno, and Llanquihue. Recently, a large population of this species was found in the sub-littoral of Lake Rupanco (Osorno); those specimens show a remarkably more prominent and profuse spinulation than those collected from streams. Since Lake Rupanco, like Lake Riñihue, is a young lake (in geological time), it is unlikely that its population of *A. denticulata* is the stem population of the less spiny riverine form. Considered from this point of view, an exceedingly prominent spinulation would be apomorphic. It is then possible that the spinulation of *A. spectabilis* was developed in a lentic environment. Such a possibility is strongly supported by the fact that during the Pliocene the region of Angol, about 70 km to the north of the type-locality of *A. spectabilis,* was occupied by lakes formed by accumulation of glacial waters along the eastern slope of the Nahuelbuta Coastal Range (Börgel 1983). If this is so, the low population density of *A. spectabilis* in the Chol Chol river basin may be indicative of its relictual condition. Nahuelbuta has been advocated as a refugial area for the preglacial Tertiary freshwater fauna of central southern Chile (Arenas 1976). Jara (1982) hypothesized that *A. bahamondei,* from the western slope of Nahuelbbuta, might represent the ancestral stock from which the lacustrine *A. rostrata* might have evolved. The finding of *A. spectabilis* on the eastern slope of Nahuelbuta reinforces the notion that this area harbours peculiar faunistic elements which render it important from a zoogeographical point of view.

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Instituto de Zoología, Universidad Austral de Chile, casilla 567, Valdivia, Chile.